

MORE AUSTRALIAN FRESHWATER SHELLS

By BERNARD C. COTTON

PLATES XIV-XIX

[Read 10 June 1943]

A paper by the present author, entitled "Australian Gastropoda of the families *Hydrobiidae*, *Assimincidae* and *Acmeidae*," was read on 13 August 1942 before this Society, and the reprint bears the date 18 December 1942. However, Volume 66, (2), of these Transactions, in which the paper is published, was not issued until 24 March 1943. Two new species there introduced were later re-named by Iredale in the Australian Zoologist, 10, (2), 30 April 1943. One new genus, *Austrohyrgus* Cotton, was omitted by him.

Professor T. H. Johnston has published in these Transactions numerous papers on Trematode worm parasites, of which certain Australian freshwater shells are named as hosts, and the scientific names of the snails quoted are those which were to the best of our knowledge, at the time, applicable. The nomenclature of these freshwater snails is very difficult and involved, and it is only recently that attempts have been made to attain to some finality in the matter. A few of the species named as hosts are here discussed. The present author is in complete agreement with Iredale and other writers on this subject in that he believes that the classification and identification of Australian freshwater Gastropoda, especially of the families Bullinidae, Lymnaeidae and Planorbidae, are extremely difficult owing to the great variation in the species. In order to help in identification, accurate figures of certain species from known localities are here reproduced.

Burton Bradley, in the Medical Journal of Australia, 1926, p. 147-159, describes the animal and shell of four freshwater gastropods, and the names used must now be adjusted.

Family VIVIPARIDAE

Three genera are recognisable in this family, *Notopala* Cotton, *Centrapala* Cotton and *Eularina* Iredale, the latter being introduced because the genus name *Larina* Adams is preoccupied by *Larinus* Germar 1824. *Notopalena* Iredale was suggested as a subgenus of *Notopala*, with the banded northern species *essingtonensis* Frauenfeld as genotype. I am inclined to think that *barretti* Cotton should go into *Notopala* with the southern non-banded types and not with *Notopalena* as suggested by Iredale. Figured here with their opercula are the species *N. hanleyi* Frauenfeld from Tailem Bend, South Australia, *N. barretti* Cotton from Innamineka, Coopers Creek, Central Australia, *N. (Notopalena) essingtonensis* from Port Essington, North Australia, and *Centrapala lirata* Tate from Innamineka, Coopers Creek, Central Australia.

Family PALUDESTRIDAE

Thirteen genera, as follows, are placed under this family by Iredale.

It would be almost impossible for anyone without the most intimate knowledge of Australian Fluvial Mollusca to separate the genera listed in this genus. For that reason a brief key is here offered, in the hope that it may help students to identify these difficult genera.

- a. Operculum not clawed.
- b. Aperture not free from the body whorl.
- c. Shell elongate.
- d. Operculum nucleus near the edge.

e.	Aperture at the top away from body whorl	....	....	<i>Austropyrgus</i>
ce.	Aperture at top close to body whorl	....	....	<i>Revisessor</i>
dd.	Operculum nucleus distant from the edge.			
f.	Sutures not margined	....	....	<i>Pupiphryx</i>
ff.	Sutures margined	....	....	<i>Phranntela</i>
cc.	Shell about as high as wide.			
g	Body whorl dilated towards the aperture.			
h.	Heavy and imperforate	....	....	<i>Petterdiana</i>
hh.	Lighter and perforate.			
i.	Spire normal.			
j.	Perforation very wide	....	....	<i>Beddomena</i>
jj.	Perforation moderately wide	....	....	<i>Tasmaniella</i>
ii.	Spire very short	....	....	<i>Valvatasma</i>
gg.	Body whorl not dilated towards the aperture	....		<i>Jardinella</i>
bb.	Aperture free from body whorl.			
k.	Whorls strongly keeled	....	....	<i>Posticobia</i>
kk.	Whorls rounded	....	....	<i>Fluzidona</i>
aa.	Operculum clawed:			
l.	Operculum with subcentral nucleus and simple claw	....		<i>Angrobia</i>
ll.	Operculum with submarginal nucleus and six digitate claw			<i>Tatea</i>

The four species placed by Iredale under *Potamopyrgus*, *nigra* Quoy and Gaimard, *petterdianus* Brazier, *legrandi* Tenison Woods and *buccinoides* Quoy and Gaimard, belong to the genus *Austropyrgus* Cotton 1943, of which *nigra* is the genotype. Figured here are the species *Austropyrgus nigra* Quoy and Gaimard from D'Entrecasteaux Channel, Tasmania, and *Revisessor tasmanicus* Martens from Lake Dulverton, Tasmania. The genus *Revisessor* Iredale seems to be closely allied to *Austropyrgus*.

Bradley's *Potamopyrgus* sp. is undoubtedly *Pupiphryx cooma* Iredale, from Cooma, southern New South Wales. Bradley well describes and figures both animal and shell of this peculiar species, the only one of the genus found in New South Wales.

Family BITHYNIIDAE

Gabbia Tryon and *Hydrococcus* Thiele are the two Australian genera. The Central Australian species, *Gabbia centralia* Iredale, was previously named *Gabbia iredalei* Cotton and *Gabbia affinis* Mousson *nom. nud.* was renamed and figured as *Gabbia relata* Cotton. *Hydrococcus graniformis* Thiele is a new name for *granum* Mencke preoccupied.

Family THIARIDAE

Here again there is little possibility of workers in the field recognising the various genera in the family, distinct as they are, without the assistance of a key. To aid in this direction a key to the genera is here offered:

a.	Shoulder of whorls with spines	....	....	<i>Thiara</i>
aa.	Shoulder of whorls without spines.			
b.	Whorls sculptured.			
c.	Spiral and axial sculpture, whorls rounded, not angled.			
d.	Spiral and axial ribs well developed	....	....	<i>Plotiopsis</i>
dd.	Spiral lirae on base, axial ribs above.	....	....	<i>Sermyllasma</i>
cc.	Axial plications above the angle on the whorls	....	....	<i>Pseudopotamis</i>
bb.	Whorls smooth.			
e.	Spire elongate, acute, aperture small and oval, whorls with a tendency to angulation at the top	....	....	<i>Stenomelania</i>
ee.	Spire truncate, aperture long and oval, whorls flattened, no angulation	....	....	<i>Ripalania</i>

Plotiopsis tatei Brazier 1881 is a new name for *Melania tetrica* Conrad 1850, preoccupied by *Melania tetrica* Gould 1847. *Melania subsimilis* Smith is a synonym. A distinct species, ***Plotiopsis centralia* sp. nov.**, is here described.

Plotiopsis centralia sp. nov.

Holotype—Length 18 mm., breadth 7 mm. Innamincka, Coopers Creek, Central Australia. D 14133. S.A. Museum.

Shell elongate, shouldered near the tops of the whorls and having the typical shape and features of the genus; sculpture of about three prominent spiral ribs on the upper whorls, the first being situated at the angle and all crossed by spaced axial ribs becoming obsolete about the middle of the whorl, though the spiral ribs continue farther down the body whorl towards the base; apex acute. Differs from *P. tatei* in the more prominent spaced sculpture, the angled whorls and wider shell.

Also figured here are the species *Thiara amaruloidea* Iredale from Cardwell, Queensland; *Plotiopsis tatei* Brazier from Tailem Bend, River Murray, South Australia; *Plotiopsis australis* Lea from Victoria River, North Australia; *Sermylasma carbonata* Reeve from Cardwell, Queensland; *Stenomelania denisonensis* Brot from the Burdekin River; *Ripalania queenslandica* Smith from Cardwell, Queensland; and *Pseudopotamis supralirata* Smith from Torres Straits.

Family COXIELLIDAE

The South Australian species *Coxiella confusa* Smith 1898, with its rounded whorls, free mouth and umbilical chink, is apparently separable from the Victorian *C. striata* Reeve = *filosa* Mitchell. *Coxiella confusa* from the Coorong, South Australia, and *Coxiella striatula* Menke from Western Australia are here figured.

Family LYMNAEIDAE

The four genera placed in this family are *Peplimnaea* Iredale, *Austropeplea* Cotton, *Simlinnea* Iredale and *Glacilimnaea* Iredale. All except the first genus are easily separable and apparently distinct from true *Lymnaea*. *Peplimnaea* is more difficult to define, although in manuscripts I had already separated the Australian series subgenerically on shell characteristics. Many subgenera are placed under *Lymnaea*, of which the genotype is *Lymnaea stagnalis* Linne of Europe, North Africa and Northern Asia. The species has been introduced into Australia as an aquarium snail and thrives under such artificial conditions. There is no record of it yet having been introduced into Australian ponds, rivers and reservoirs, but it would no doubt thrive in them if given the opportunity. Both the shell with its exceptionally long spire and the radula, which shows minor differences from our common *Lymnaea lessoni*, are the chief points supporting separation. So far, no differences of any consequence have been discovered in any other anatomical details, rather has the similarity been noted. *Lymnaea lessoni* has been placed in *Amphipeplea* Nilsson 1823 = *Myxas* Leach 1822 (genotype of both is *Lymnaea glutinosa* Muller of Europe), but there is considerable anatomical difference in the Australian species. *Lymnaea lessoni* may be briefly described as follows:—Foot large, elongated; no expansion of the mantle over the outside of the shell and the limits of the parietal lamina can be distinctly traced, resembling *Lymnaea* rather than *Amphipeplea*; tentacles broad, acutely triangular and flat; the whole surface of the animal, including tentacles, base of the foot and even portion of the body within the shell is light grey and numerous spotted with minute white dots; egg-mass reniform, 18 mm. in length, containing 30 embryos. Shell large, globose, thin, pellucid, spire short, whorls few (about four), sculptured with numerous regular accremental striae, crossed by even finer regular microscopic spirals, suture slightly impressed, aperture wide, outer lip thin and simple; columella with one simple fold; inner margin of aperture widely spread with a dull nacreous deposit. The type locality of the species is River Macquarie at Bathurst, New South Wales, and the specimens described and figured are from Tailem Bend, River Murray, South Australia, where the species

- 4 In specimens from two different though close localities, and apparently of the same variety, those from one locality may revert to type under aquarium breeding conditions, while those from the other locality may not.
- 5 The species is very susceptible to environmental conditions and is also subject to periodical cycles of variation.
- 6 It may be smooth or sculptured with strong spiral ridges.
- 7 The colour varies from typical horn-yellow to banded with brown and white in the variety "*picta*."
- 8 It inhabits brackish water, maritime marshes, lakes, ponds, peat bogs, crawls on to dry land, or in the event of water drying up buries in mud, under stones, weeds or debris.
- 9 It ranges over Europe, North Africa, Asia, Cape Verde Islands, and in Iceland has been seen living in a spring at 40° C.

Family BULLINIDAE

The variability of the species in this family is extraordinary, though no doubt there is some geographical arrangement. Only names of specimens from known localities are here accepted, described or figured. I anticipated that the genus *Amerianna* Strand might be cut up into further genera with the words, "No doubt this will be split up by future workers," and, "The typically carinate shell appears so different from the ordinary *tenniestrata* type with its taller spire and rounded whorls." This has been done by Iredale. The following genera are located in the family: *Lenameria* Iredale, *Glyptamoda* Iredale, *Tasmadora* Iredale, *Amerianna* Strand, *Oppletora* Iredale and Whitley, *Isidorella* Tate. The following key will help workers to identify the genera:

- | | | | | | | |
|---|------|------|------|------|------|-------------------|
| a. Spire long, but usually shorter than the aperture. | | | | | | |
| b. No prominent sculpture | .... | .... | .... | .... | .... | <i>Lenameria</i> |
| bb. Prominent spiral sculpture | .... | .... | .... | .... | .... | <i>Glyptamoda</i> |
| aa. Spire short. | | | | | | |
| c. Spire not truncate, body whorl wide. | | | | | | |
| d. Columella not truncate. | | | | | | |
| e. Columella strongly folded | .... | .... | .... | .... | .... | <i>Tasmadora</i> |
| ec. Columella not folded | .... | .... | .... | .... | .... | <i>Isidorella</i> |
| dd. Columella truncate | .... | .... | .... | .... | .... | <i>Oppletora</i> |
| cc. Spire truncate, body whorl normal | .... | .... | .... | .... | .... | <i>Amerianna</i> |

The following species are figured here: *Lenameria nitida* Sowerby, Great Lake, Tasmania; *Lenameria vandiemenensis* Sowerby, North Tasmania; *Lenameria georgiana* Quoy and Gaimard, South-West Australia; *Lenameria pyramidata* Sowerby, Lake Dulverton, Middle East Tasmania; *Lenameria pyramidata* Sowerby, dark-coloured variant from Tasmania; *Lenameria attenuata* Sowerby, Lake Dulverton, Tasmania; *Lenameria mamillata* Sowerby, Tasmania; *Lenameria queenslandica* Smith, Ipswich, Queensland; *Lenameria beddomei* Nelson and Taylor, Rockhampton, Queensland; *Glyptamoda aliciae* Reeve, River Torrens at Felixtowe, South Australia; *Tasmadora aperta* Sowerby, First Basin, Launceston, Tasmania; ***Tasmadora sorellensis*** sp. nov., Lake Sorrell, Tasmania; *Amerianna carinata* Adams, Boyne River, Queensland; *Amerianna bonushenricus* Adams and Angas, Arnhem Land, North Australia; *Oppletora jukesi* Adams, Yam Creek; *Isidorella newcombi* Adams and Angas, Mount Margaret, Central Australia; *Isidorella subinflata* Sowerby, River Torrens, South Australia; *Isidorella rubida* Cotton and Godfrey, Franklin Harbour, South Australia.

Amerianna bonushenricus shows a considerable difference from *carinata*. The columella fold is almost obsolete and there is no carination of the body whorl. In many respects it recalls *Isidorella* except that the spire is peculiarly depressed. It is here separated subgenerically under the name **Ameriella** sub. nov.

Tasmadora sorellensis sp. nov.

Holotype—Length 10 mm., breadth 6 mm. Lake Sorell, Middle Tasmania, D. 14132 S.A. Museum. Shell small, thin, greenish coloured, polished; columella fold well developed; spire slightly more elongate than in the typical species of the genus and the body whorl narrower. The shape and colouration readily separate this species from the genotype *Tasmadora aperta* Sowerby, which is found in Northern Tasmania.

Family PLANORBIDAE

Five genera are represented in this family: *Segnitila* Cotton and Godfrey, *Pygmanisus* Iredale, *Plananisus* Iredale, *Glyptanisis* Iredale and *Glacidorbis* Iredale. The following key will assist in their recognition:

- a. Shell depressed, diameter three or more times the height, base flattened.
 - b. Shell solid, compressed *Segnitila*
 - bb. Shell thin, rounded.
 - c. Whorls rounded.
 - d. Small, rounded mouth *Pygmanisus*
 - dd. Large oblique mouth *Plananisus*
 - cc. Whorls keeled at the periphery *Glyptanisis*
 - aa. Shell comparatively high, diameter twice the height *Glacidorbis*

Figured here is *Segnitila victoriae* Smith, South Australia. There are apparently very weak internal lamellae in specimens of the species from Victoria, but they can only be seen when the shell aperture is broken carefully away for about one-third of the whorl. The weak development of these lamellae and the smallness of the species, distinguish this Australian genus. The species *alphena* Iredale has no internal lamellae and closely resembles *victoriae* in form. *Plananisus isingi* Cotton and Godfrey, Lake Alexandrina, is found at times in countless thousands amongst the "Carpet Weed" so common in billabongs on the Lower Murray. Although found alive at Tailem Bend Swamp some ten years ago, only dead shells have been taken during the last few years, and these are in great number. It is no doubt still plentiful in parts of the Murray. ***Pygmanisus parvus*** sp. nov., River Torrens; *Glyptanisis meridionalis* Brazier, South Tasmania; *Glyptanisis atkinsoni* Johnston, South Esk, Tasmania; and *Glyptanisis atkinsoni* Johnston, variant from Great Lake, Tasmania, are all figured here.

Pygmanisus parvus sp. nov.

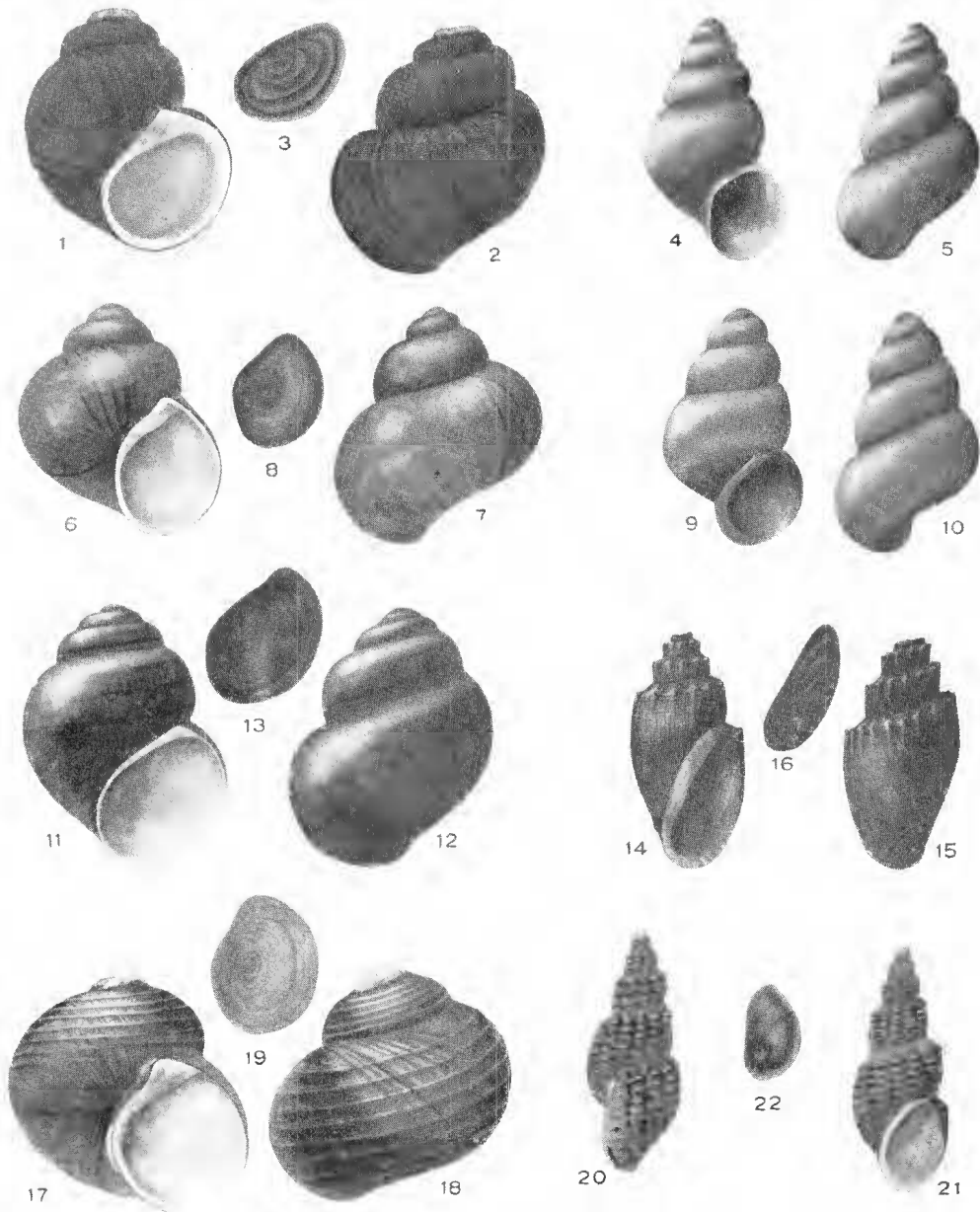
Holotype—Diameter 5 mm. Height 1.25 mm. River Torrens, South Australia, D. 14131 S.A. Museum. Shell small, whorls rounded, aperture rounded, sculpture of growth lines only, otherwise typical of the genus and resembling the genotype, *Pygmanisus scottianus* Johnston from Launceston, Northern Tasmania.

Family ANCYLIDAE

The species figured here are *Pettancyclus australicus* Tate, River Torrens, Adelaide, where the species is common on smooth stones and weeds; *Problancyclus beddomei* Petterd, Queensborough, Tasmania; *Problancyclus eremius* Cotton and Godfrey, Mount Lofty, South Australia, is apparently extremely rare and its generic location a problem, but whether it represents a *Pettancyclus* with a marked growth stage or is generically distinct cannot as yet be determined, though it certainly has little to do with true *Gundlachia*. The specimens are probably aberrant, as Iredale suggests.

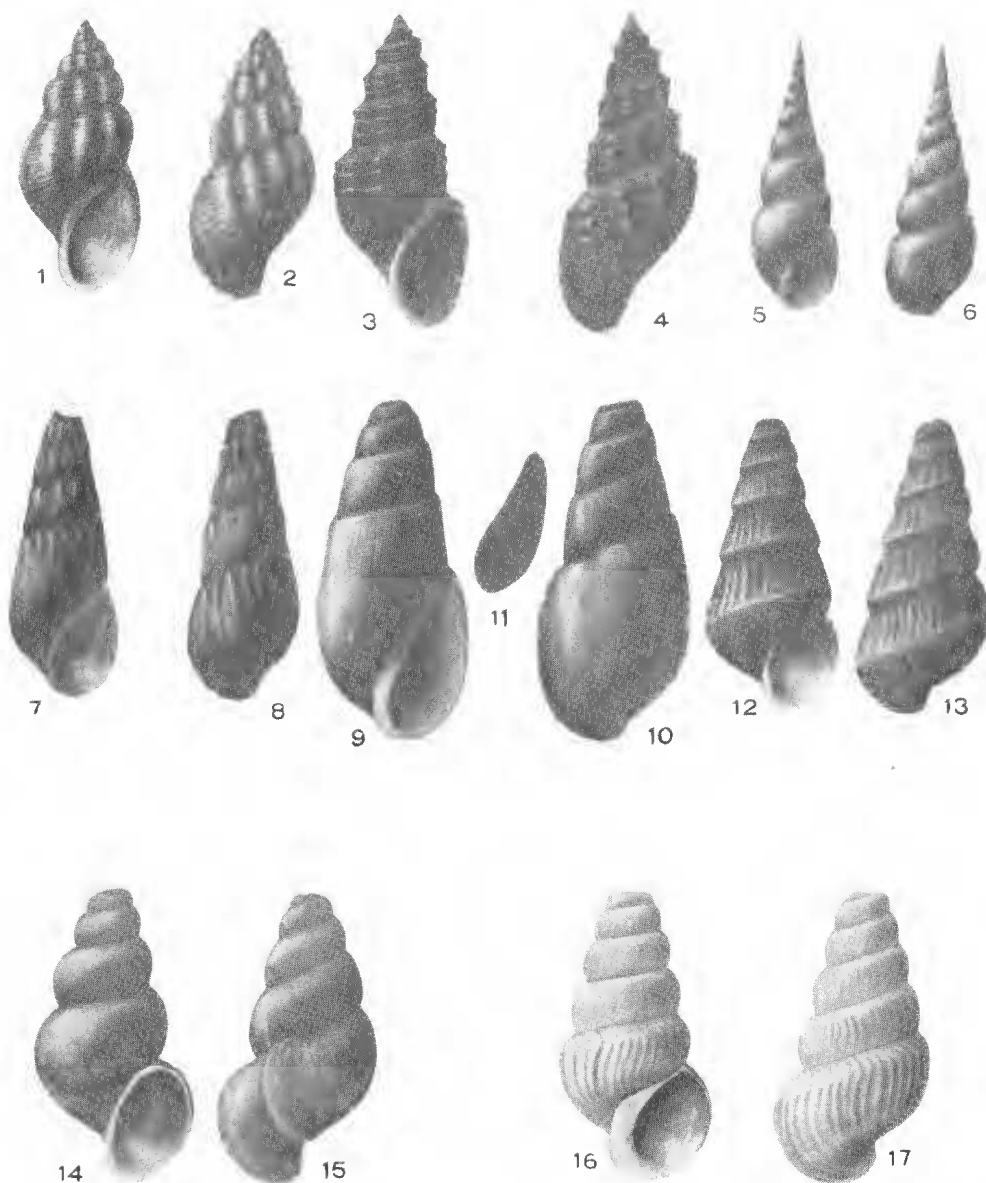
Family ASSIMINEIDAE

The estuarine species listed by me as *Assimineca tasmanica* Tenison Woods is here figured from a specimen taken at Ralph's Bay, Tasmania. The generic location of this species is doubtful. Previously placed in this family was *Paludina granum* Menke (preoccupied) = *graniformis* Thiele, which is now the genotype of *Hydrococcus* Thiele and allotted to the family *Bithyniidae*.



G WALSH

Fig. 1-2, *Notopala hanleyi* Frauenfeld, ventral and dorsal x 1.5, fig. 3, ditto operculum; fig. 4-5, *Austropyrgus nigra* Quoy & Gaimard, ventral and dorsal; fig. 6-7, *Notopala barretti* Cotton, ventral and dorsal x 2, fig. 8, ditto operculum; fig. 9-10, *Revisessor tasmanicus* Martens, ventral and dorsal x 10; fig. 11, 12, *Notopala (Notopalena) essingtonensis* Frauenfeld, ventral and dorsal x 1.5, fig. 13, ditto operculum; fig. 14-15, *Thiara amuruloidea* Iredale, ventral and dorsal x 1, fig. 16, ditto operculum; fig. 17-18, *Centrapala lirata* Tate, ventral and dorsal x 2, fig. 19, ditto operculum; fig. 20-21, *Plotiopsis tatei* Brazier, ventral and dorsal x 1.5, fig. 22, ditto operculum.



G. WALSH

Fig. 1-2, *Plotiopsis australis* Lea, ventral and dorsal $\times 2.5$; fig. 3-4, *Plotiopsis centralia* sp. nov., ventral and dorsal $\times 2.5$; fig. 5-6, *Stenomelania denisonensis* Brot, ventral and dorsal $\times 1$; fig. 7-8, *Sermylasma carbonata* Reeve, ventral and dorsal $\times 1$; fig. 9-10, *Ripalania queenslandica* Smith, ventral and dorsal $\times 1.5$, fig. 11 ditto operculum; fig. 12-13, *Pseudotamias supralirata* Smith, ventral and dorsal $\times 2.5$; fig. 14-15, *Cociella confusa* Smith, ventral and dorsal $\times 3.5$; fig. 16-17, *Cociella striatula* Menke, ventral and dorsal $\times 2.5$.

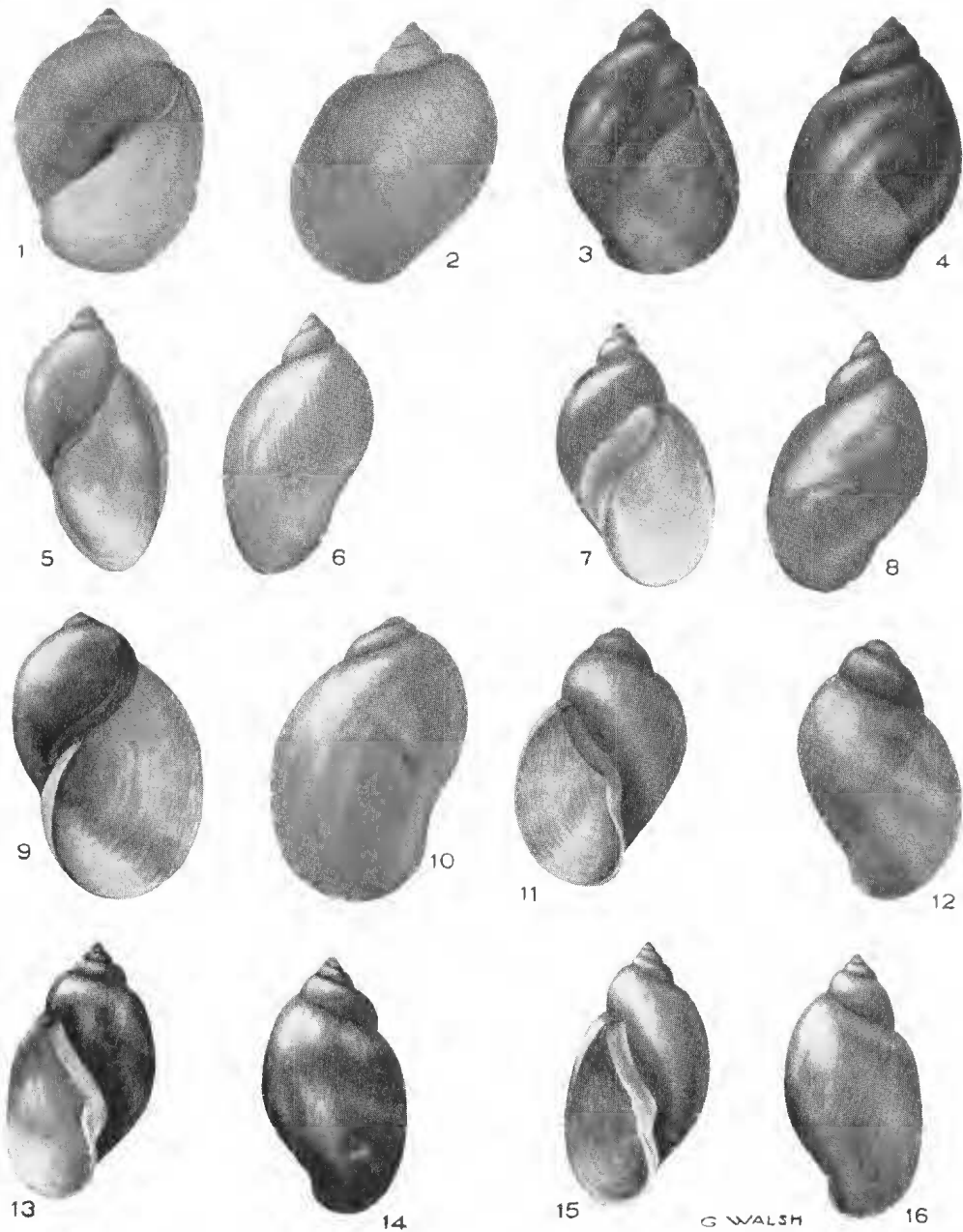


Fig. 1-2, *Lymnaca lessoni* Deshayes, ventral and dorsal $\times 1.5$; fig. 3-4, *Lymnaca vimosa* Adams and Angas, ventral and dorsal $\times 1.5$; fig. 5-6, *Austropeplea aruntalis* Cotton and Godfrey, ventral and dorsal 2.5 ; fig. 7-8, *Austropeplea subaquatilis* Tate, ventral and dorsal $\times 3.5$; fig. 9-10, *Simlimnca gunnii* Petterd, ventral and dorsal $\times 7$; fig. 11-12, *Lenameria nitida* Sowerby, ventral and dorsal $\times 4$; fig. 13-14, *Lenameria caudiemencensis* Sowerby, ventral and dorsal $\times 1.5$; fig. 15-16, *Lenameria georgiana* Quoy and Gaimard, ventral and dorsal $\times 2.5$.

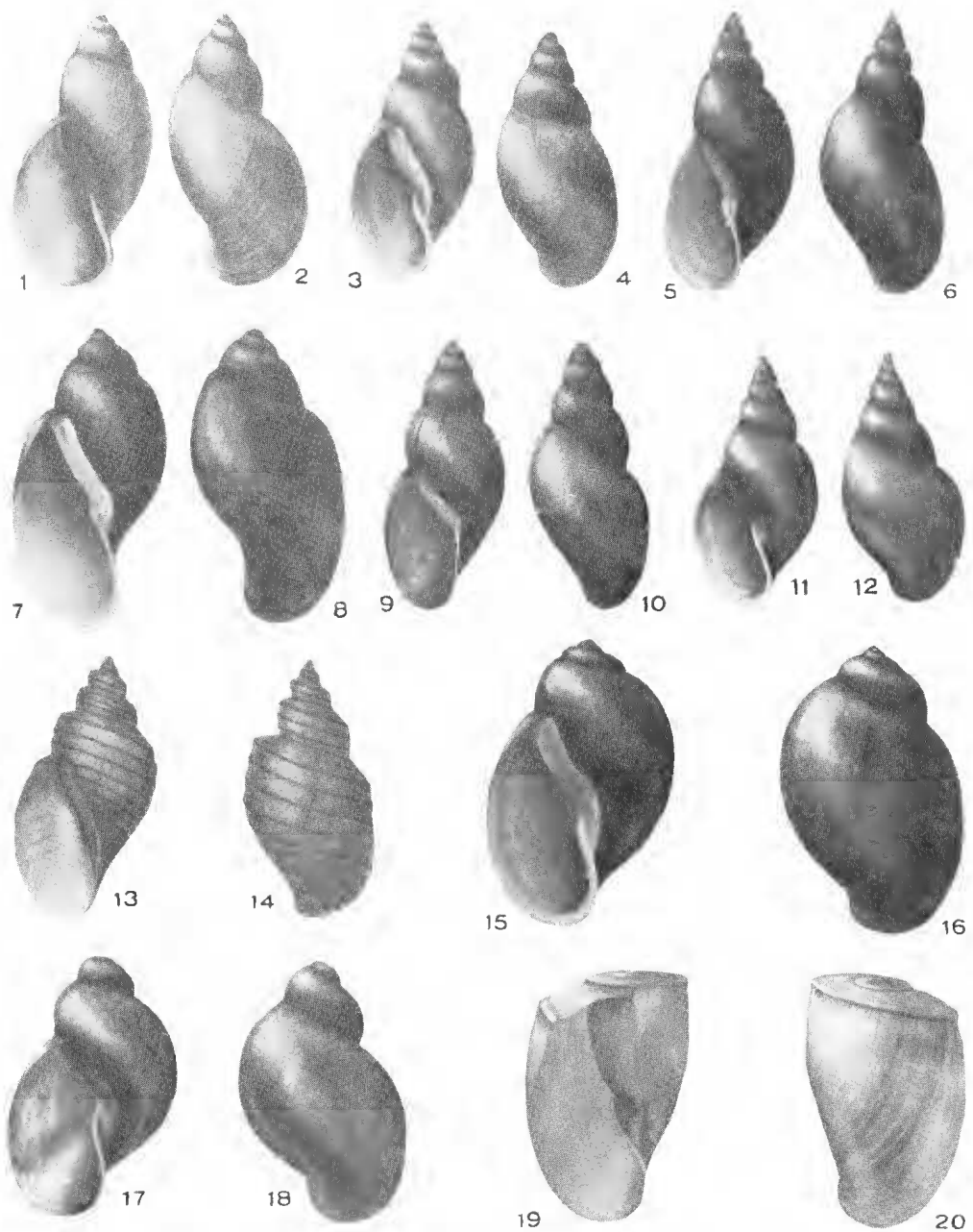


Fig. 1-2, *Lenameria pyramidata* Sowerby, ventral and dorsal x 2; fig. 3-4, *Lenameria pyramidata* Sowerby, variant, ventral and dorsal x 3; fig. 5-6, *Lenameria attenuata* Sowerby, ventral and dorsal x 1.5; fig. 7-8, *Lenameria mamillata* Sowerby, ventral and dorsal x 2; fig. 9-10, *Lenameria queenslandica* Smith, ventral and dorsal x 3; fig. 11-12, *Lenameria beddomei* Nelson and Taylor, ventral and dorsal x 2; fig. 13-14, *Glyptanoda aliciae* Reeve, ventral and dorsal x 2.5; fig. 15-16 *Tasmadora aperta* Sowerby, ventral and dorsal x 3.5; fig. 17-18, *Tasmadora sorellensis* sp. nov., ventral and dorsal x 3.5; fig. 19-20, *Amerianna carinata* Adams, ventral and dorsal x 2.5.

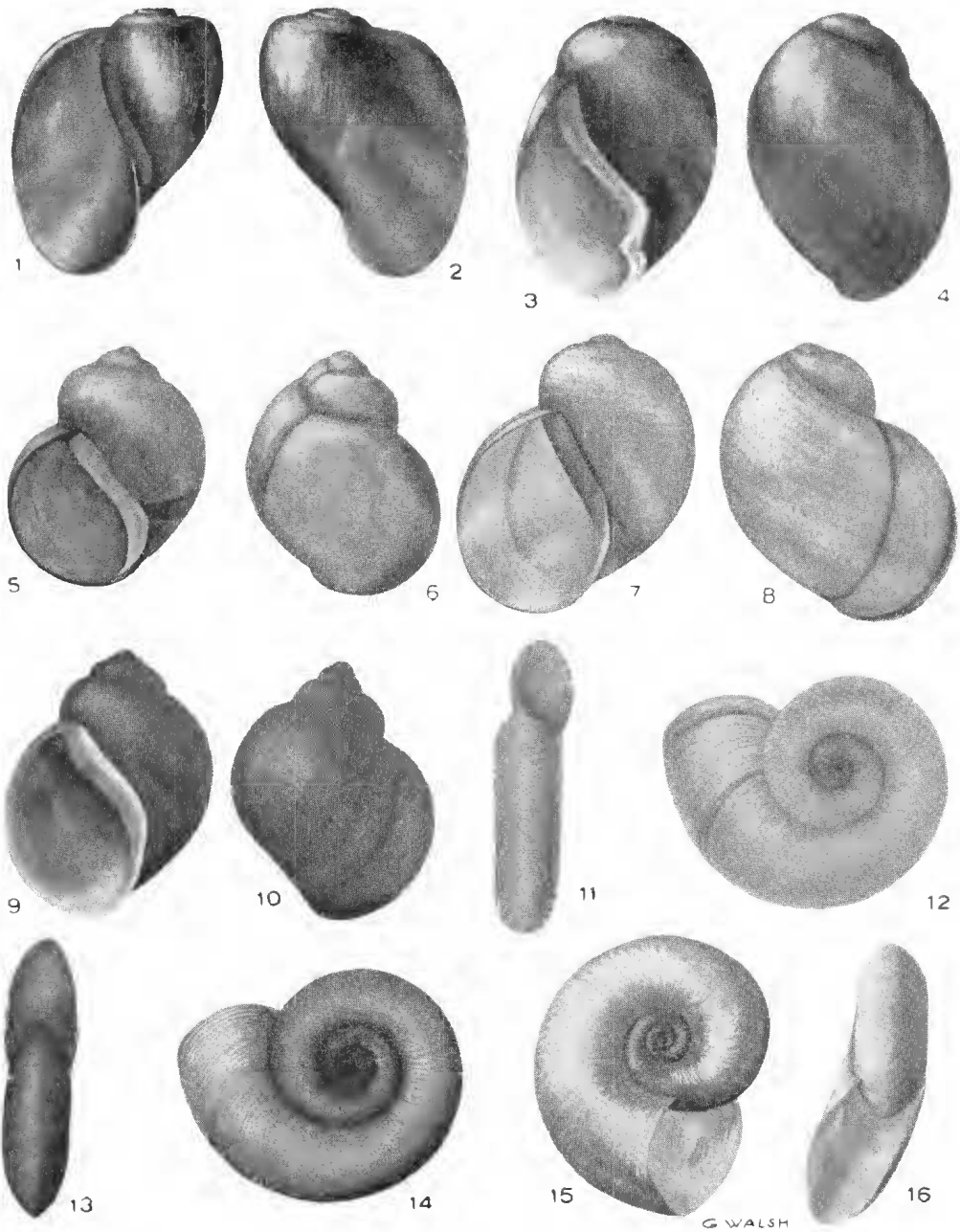


Fig. 1-2, *Amerianna (Ameriella) bonushenricus* Adams and Angas, ventral and dorsal x 4.5; fig. 3-4, *Opptetora jukesi* Adams, ventral and dorsal x 6; fig. 5-6, *Isidorella newcombi* Adams and Angas, ventral and dorsal x 2.5; fig. 7-8, *Isidorella subinflata* Sowerby, ventral and dorsal x 3.5; fig. 9-10, *Isidorella rubida* Cotton and Godfrey, ventral and dorsal x 3.5; fig. 11-12, *Pygmanisus parvus* sp. nov., lateral and dorsal x 8.5; fig. 13-14, *Plananisus isingi* Cotton and Godfrey, lateral and dorsal x 8.5; fig. 15-16, *Glyptanisus mridionalis* Brazier, dorsal and lateral x 8.

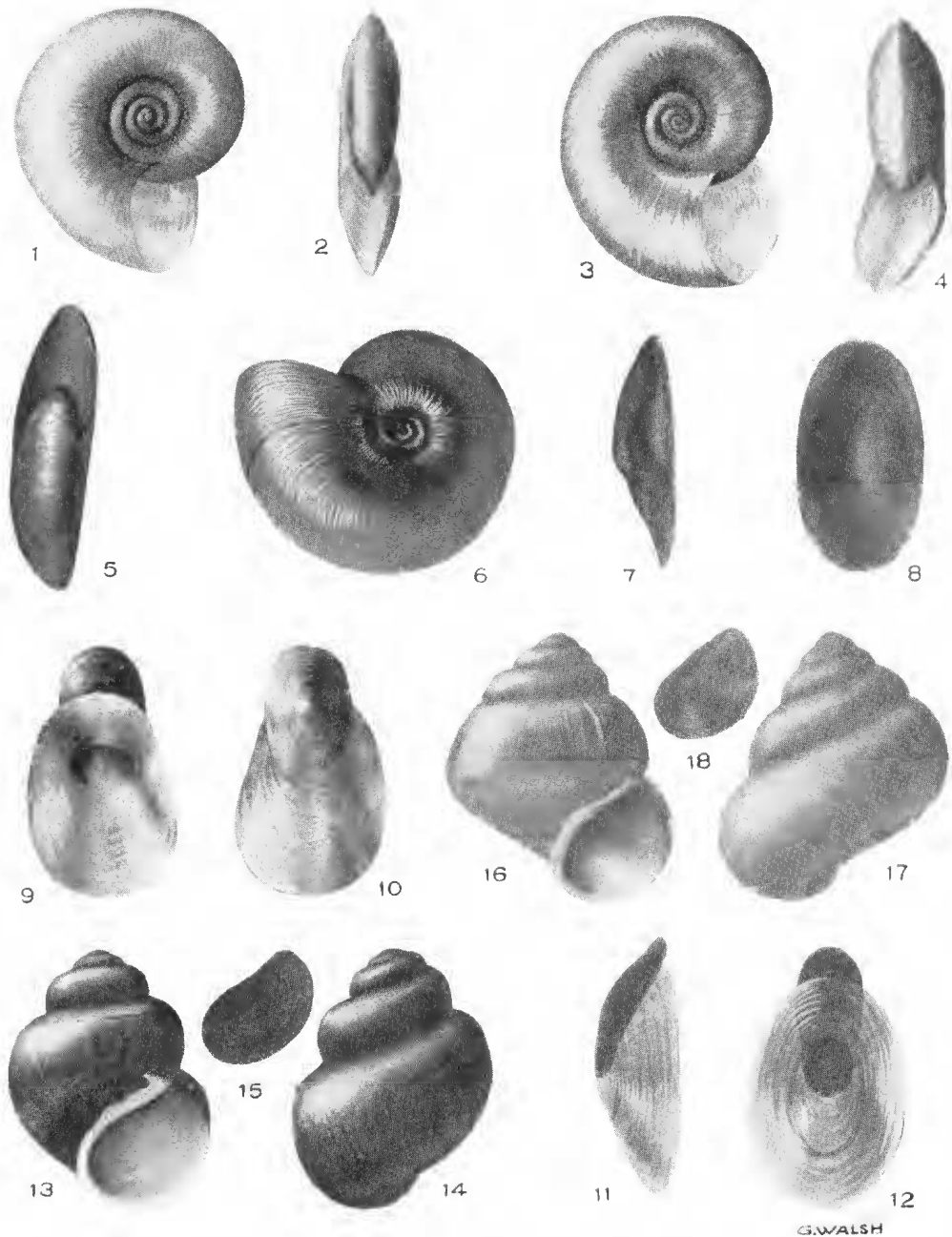


Fig. 1-2, *Glyptaniscus atkinsoni* Johnston, dorsal and lateral $\times 10$; fig. 3-4, ditto Johnston, dorsal and lateral, variant, $\times 6.5$; fig. 5-6, *Segmitila victoriae* Smith, lateral and dorsal $\times 6.5$; fig. 7-8, *Pettancylus australicus* Tate, lateral and dorsal $\times 7$; fig. 9-10, *Problancylus beddomei* Petterd, ventral and dorsal $\times 9$; fig. 11-12, *Problancylus cremius* Cotton and Godfrey, lateral and ventral; fig. 13-14, *Notopala (Notopalena) waterhousei* Adams and Angas, ventral and dorsal $\times 1$, fig. 15, ditto operculum; fig. 16-17, *Assiminca tasmanica* Tenison Woods, ventral and dorsal $\times 9$, fig. 18, ditto operculum.